

What is claimed is:

1. An optical service agent for managing communication services for a user in an optical communication system, the optical service agent
5 comprising:
a user-to-network interface (UNI) for interfacing with an optical communication network; and
optical service logic for obtaining optical communication services from the optical communication network via the UNI and managing said optical
10 communication services for the user.
2. The optical service agent of claim 1, wherein the optical communication network comprises an automatically switched optical/transport network (ASON), and wherein the UNI comprises an
15 ASON UNI.
3. The optical service agent of claim 1, further comprising auto-discovery logic for automatically discovering peer users.
- 20 4. The optical service agent of claim 3, wherein the auto-discovery logic comprises an advertisement mechanism for sending and receiving peer information.
5. The optical service agent of claim 4, further comprising a peer database
25 for storing peer information.
6. The optical service agent of claim 1, further comprising peer authentication logic for authenticating peer users.
- 30 7. The optical service agent of claim 1, further comprising peer-to-peer signaling logic for communicating with peer users.

8. The optical service agent of claim 7, wherein the optical service logic coordinates communication services with peer users via the peer-to-peer signaling logic.

5 9. The optical service agent of claim 1, wherein the optical service agent comprises an application component and a network component.

10. The optical service agent of claim 9, wherein the application component and the network component are situated within the user, and
10 wherein the network component implements the UNI for interfacing with the optical communication network.

11. The optical service agent of claim 9, wherein the application component is situated within the user and the network component is situated
15 within the optical communication network, and wherein the application component and the network component communicate via the UNI.

12. The optical service agent of claim 9, wherein the application component and the network component communicate via a control interface,
20 and wherein the network component interfaces with the optical communication network via the UNI as a proxy for the application component.

13. The optical service agent of claim 1, further comprising an application
25 program interface (API) for interfacing with a user application.

14. A device comprising:

a user application requiring communication services from an optical communication network; and

an optical service agent for obtaining optical communication services
5 from the optical communication network via a user-to-network interface
(UNI) and managing said optical communication services for the user
application.

15. The device of claim 14, wherein the optical communication network
10 comprises an automatically switched optical/transport network (ASON), and
wherein the UNI comprises an ASON UNI.

16. The device of claim 14, wherein the optical service agent comprises
auto-discovery logic for automatically discovering peer users.

17. The device of claim 16, wherein the auto-discovery logic comprises an
advertisement mechanism for sending and receiving peer information.

18. The device of claim 14, wherein the optical service agent comprises a
20 peer database for storing peer information.

19. The device of claim 14, wherein the optical service agent comprises
peer authentication logic for authenticating peer users.

20. The device of claim 14, wherein the optical service agent comprises
25 peer-to-peer signaling logic for communicating with peer users.

21. The device of claim 20, wherein the optical service agent coordinates
communication services with peer users via the peer-to-peer signaling logic.

22. The device of claim 14, wherein the optical service agent comprises an
30 application component and a network component, and wherein the network

component implements the UNI for interfacing with the optical communication network.

23. The device of claim 14, wherein the optical service agent comprises an
5 application component that communicates with a peer network component in the optical communication network via the UNI.

24. The device of claim 14, wherein the optical service agent comprises an
application component that communicates with a network component via a
10 control interface, and wherein the network component interfaces with the optical communication network via the UNI as a proxy for the application component.

25. The device of claim 14, wherein the optical service agent comprises an
15 application program interface (API) for interfacing with the user application.

26. A device for use in optical communication network, the device comprising:

a controller for providing optical communication services; and
an optical service agent for obtaining optical communication services

5 from the controller and managing said optical communication services for a network user.

27. The device of claim 26, wherein the optical service agent implements a user-to-network interface (UNI) for interfacing with the network user.

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28. The device of claim 27, wherein the optical communication network comprises an automatically switched optical/transport network (ASON), and wherein the UNI comprises an ASON UNI.

29. A system comprising:

an optical communication network; and

a first network user coupled to the optical communication network,

wherein the first network user comprises an optical service agent for

5 obtaining optical communication services from the optical communication
network via a user-to-network interface (UNI) and for managing the optical
communication services for the first network user.

30. The system of claim 29, wherein the optical communication network

10 comprises an automatically switched optical/transport network (ASON), and
wherein the UNI comprises an ASON UNI.

31. The system of claim 29, wherein the optical service agent comprises an
application component and a network component, and the network

15 component implements the UNI for interfacing with the optical
communication network.

32. The system of claim 29, wherein the optical service agent comprises an
application component and the optical communication network comprises

20 network component, and wherein the application component and the
network component communicate via the UNI.

33. The system of claim 29, further comprising a network component,
wherein the optical service agent comprises an application component that

25 communicates with the network component via a control interface, and
wherein the network component interfaces with the optical communication
network via the UNI as a proxy for the application component.

34. The system of claim 29, further comprising a second network user

30 coupled to the optical communication network, said second network user
comprising a second optical service agent.

35. The system of claim 34, wherein each of said optical service agents comprises auto-discovery logic for automatically discovering the other of said optical service agents.

5 36. The system of claim 34, wherein each of said optical service agents comprises peer authentication logic for authenticating the other of said optical service agents.

10 37. The system of claim 34, wherein each of said optical service agents comprises peer-to-peer signaling logic for coordinating communication services with the other of said optical service agents.

15 38. The system of claim 29, further comprising a second network user coupled to the optical communication network, said second network user excluding an optical service agent.

39. A method for automatically discovering and authenticating peer users in an optical communication system, the optical communication system comprising an optical communication network including a plurality of edge nodes through which the peer users access the optical communication network and an optical service server (OSS) for coordinating various communication services provided by the optical communication network, the method comprising:

registering peer users with the OSS; and
distributing peer information to the peer users by the OSS.

40. The method of claim 39, wherein registering peer users with the OSS comprises:

registering a first peer user with the OSS; and
registering a second peer user with the OSS.

41. The method of claim 40, wherein registering the first peer user with the OSS comprises:

sending a registration request by a first peer user to a first edge node;
authenticating the first peer user by the first edge node; and
sending a join message by the first edge node to the OSS identifying the first peer user.

42. The method of claim 41, wherein the registration request comprises a group identifier identifying a peer group.

43. The method of claim 42, wherein the join message comprises:
the group identifier identifying the peer group; and
a user identifier identifying the first peer user.

44. The method of claim 41, wherein authenticating the first peer user by the first edge node comprises:

sending a challenge message by the first edge node to the first peer user providing an opportunity for the first peer user to positively identify itself to the optical communication network;

5 sending a challenge response message by the first peer user to the first edge node positively identifying itself to the optical communication network through a cryptographic authentication mechanism; and

authenticating the first peer user by the first edge node based upon the challenge response message.

10 45. The method of claim 41, wherein authenticating the first peer user by the first edge node based upon the challenge response message comprises:

interacting with a network element as part of the cryptographic authentication mechanism.

15 46. The method of claim 41, further comprising:

sending a success message by the first edge node to the first peer user upon authenticating the first peer user in order to confirm authentication and registration of the first peer user.

20 47. The method of claim 41, further comprising:

storing information relating to the first peer user in a peer database upon receiving the join message from the first edge node.

25 48. The method of claim 40, wherein distributing peer information to the peer users by the OSS comprises:

sending information relating to the second peer user to the first peer user.

30 49. The method of claim 40, wherein distributing peer information to the peer users by the OSS comprises:

sending information relating to the first peer user to the second peer user.